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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/738,165	12/15/2000	Tamiya Onodera	JA919990276	2290
46369	7590	01/24/2005	EXAMINER	
HESLIN ROTHENBERG FARLEY & MESITI P.C.			ALI, SYED J	
5 COLUMBIA CIRCLE			ART UNIT	
ALBANY, NY 12203			PAPER NUMBER	
			2127	

DATE MAILED: 01/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/738,165

Applicant(s)

ONODERA, TAMIYA

Examiner

Syed J Ali

Art Unit

2127

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 07 September 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

1. This office action is in response to the amendment filed September 7, 2004. Claims 1-18 are presented for examination.

2. The text of those sections of Title 35, U.S. code not included in this office action can be found in a prior office action.

#### ***Claim Rejections - 35 USC § 101***

3. **Claims 5-8 and 14-18 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.**

4. As per claims 5, 14, and 16, the apparatus is at best a software system, per se, failing to be tangibly embodied or include any recited hardware as part of the apparatus.

5. As per claims 6-8, 15, and 17-18, they are dependent from non-statutory claims 5, 14, and 16, respectively, and are thus non-statutory for at least the same reasons as discussed for their parent claims, as they also fail to recite any limitations that resolve the deficiencies noted above in the claims from which they depend.

#### ***Claim Rejections - 35 USC § 103***

6. **Claims 1-18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Agesen et al. (USPN 6,173,442) (hereinafter Agesen).**

7. As per claims 1-4, Agesen teaches the invention as claimed, including in a shared memory model system, a method whereby, in a state wherein a plurality of threads exist, a bit that represents a lock type and an identifier for a thread that has acquired a lock in accordance with a first lock type, or an identifier of a second lock type, are stored in a storage area that corresponds to an object and a lock on an object is thus managed, said method comprising:

determining, if a second thread attempts to acquire a lock on a specific object that is held by a first thread, whether a bit that represents said lock type on said specific object represents said first lock type (col. 15 lines 30-34; col. 15 lines 45-49; col. 15 lines 53-64);

setting a contention bit if said bit represents said first lock type (col. 16 lines 40-44; col. 16 lines 66 - col. 17 line 4);

shifting said first thread, when said contention bit has been set, to an exclusive control state for a mechanism that enables the exclusive control of the accessing of said object (col. 11 lines 55-59; col. 15 lines 53-64), and a thread waiting operation and the transmission to a waiting thread of a notification (col. 12 lines 51-56), both of which are to be performed when a predetermined condition has been established (col. 14 lines 29-49);

permitting said first thread to transmit said notification to said waiting thread (col. 14 lines 29-49);

setting said second thread in the busy waiting state, when said predetermined condition has not been established and when said special identifier has been stored, until a thread that holds said lock on said specific object is no longer present and until said bit that represents said lock type represents said first lock type (col. 11 lines 55-59; col. 12 lines 51-56);

permitting said first thread to exit said exclusive control state (col. 14 lines 42-49);

determining, before said first thread unlocks said specific object, whether said bit that represents said lock type represents said first lock type (col. 15 lines 30-34; col. 15 lines 45-49; col. 15 lines 53-64);

storing in said storage area a special identifier that differs from the identifiers for said plurality of threads (col. 16 line 66 - col. 17 line 4);

issuing a synchronization command for said memory system (col. 17 lines 49-59);

storing in said storage area data indicating the absence of a thread that holds said lock on said specific object (col. 18 lines 40-43);

determining whether said contention bit has been set if said bit that represents said lock type represents said first lock type (col. 17 lines 49-59);

terminating an unlocking process if said contention bit has not been set without any other process being performed (col. 17 lines 49-59);

wherein said first lock type is a lock method whereby to manage a lock state an identifier for a thread that has locked an object is stored in correlation with said object (col. 15 lines 53-66); and

wherein said second lock type is a lock method whereby a queue is employed to manage a thread that has locked an access to an object (col. 12 lines 51-62).

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8. It is noted that there is a slight difference between Agesen and the claimed invention in the determination of the lock type. While the claimed invention determines the lock type by checking a bit, Agesen calls a method (“getMetaLock”) that returns a bit field that indicates whether there is contention. When there is contention, the lock operates by storing the locking thread’s identifier in the lock object, corresponding to the claimed “first lock type”. On the other hand, if there is no contention, a linked list is utilized to control access to the lock, corresponding to the claimed “second lock type”. This discussion of the differences between Agesen and the claimed invention is incorporated by reference into the rejection of the other independent claims 5, 9, 11, 14, and 16.

9. As per claims 5-8, Agesen teaches the invention as claimed, including an apparatus comprising means for implementing the method of claims 1-4, respectively (Fig. 1).

10. As per claims 9-10, Agesen teaches the invention as claimed, including in a shared memory model system, a method whereby, in a state wherein a plurality of threads exist, a bit that represents a lock is stored in a storage area that corresponds to an object, and a queue of a thread that accesses said object is stored to manage a lock on an object, said method comprising:

determining, when a second thread attempts to acquire a lock on a specific object that a first thread has locked, whether a bit that is used to represent said lock on said object represents the locked state (col. 11 lines 28-31; col. 11 lines 41-42);

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changing data for the number of queues of threads that access said specific object and storing the updated data when said bit represents said locked state (col. 11 lines 35-41; col. 11 lines 62-65);

increasing, when said bit that represents said locked state is set, the number of queues of threads that can access said specific object and storing the updated number, and determining whether said bit that represents said lock on said specific object represents said locked state (col. 11 lines 35-41; col. 11 lines 62-65);

reducing, when said bit that represents said locked state is not set, the number of said queues of said threads that access said specific object and storing the updated number, and terminating a locking process without any other process being performed (col. 14 line 53 - col. 15 line 3)

storing said second thread in a queue, and shifting said second thread to a control state, for a mechanism that performs a waiting operation for accessing said specific object and a recovery operation by transmitting a notification (col. 12 lines 51-60);

storing said bit that represents said locked state in said storage area before said first thread unlocks said object (col. 14 lines 53-57);

determining whether a thread that is stored in a queue is present (col. 14 lines 53-57);

shifting said first thread to a notification state, wherein said transmission of a notification to said thread that is waiting is initiated, when a thread that is stored in a queue is present (col. 12 lines 51-60; col. 14 lines 29-49); and

permitting said first thread to exit said notification state (col. 14 lines 29-49).

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11. As per claims 11-13, Agesen teaches the invention as claimed, including in a shared memory model system, a method whereby, in a state wherein a plurality of threads exist, a bit that represents a lock is stored in a storage area that corresponds to an object, and a queue of threads that access said object is stored to manage a lock on an object, said method comprising:

determining, when a second thread attempts to acquire a lock on a specific object that a first thread has locked, whether a bit that represents said lock on said object represents the locked state (col. 11 lines 28-31; col. 11 lines 41-42);

increasing, when said bit that represents said locked state is set, the number of queues of threads that can access said specific object and storing the updated number, and determining whether said bit that represents said lock on said specific object represents said locked state (col. 11 lines 35-41; col. 11 lines 62-65);

reducing, when said bit that represents said locked state is not set, the number of said queues of said threads that access said specific object and storing the updated number, and terminating a locking process without any other process being performed (col. 14 line 53 - col. 15 line 3);

changing, when said bit represents said locked state, data for the number of queues of threads that can access said specific object and storing the updated data, and thereafter issuing a synchronization command for said storage area (col. 11 lines 35-41; col. 11 lines 62-65);

storing said second thread in a queue, and shifting said second thread to a control state for a mechanism that performs a waiting operation, for accessing said specific object, and a recovery operation by transmitting a notification (col. 12 lines 51-60);



storing in said storage area, before said first thread unlocks said object, said bit that represents said locked state and an identifier that is not related to the representation of said locked state or unlocked state (col. 14 lines 53-57);

permitting said second thread, when said bit that represents said locked state is set and when an identifier that is not related to the representation of said locked state or said unlocked state is stored in said storage area, to remain in a busy waiting state until a thread that maintains said lock on said object is no longer present and said bit that represents said locked state is changed to represent said unlocked state (col. 12 lines 51-60; col. 14 line 29 - col. 15 line 3);

issuing a synchronization command for said storage area (col. 17 lines 49-59);

storing, in said storage area, data that does not represent said lock on said specific object (col. 16 line 66 - col. 17 line 4);

determining whether a thread that is stored in a queue is present (col. 14 lines 53-57);

shifting, when a thread that is stored in a queue is present, said first thread to a notification state wherein said transmission is initiated for issuing a notification to said thread that is waiting (col. 12 lines 51-60; col. 14 lines 29-49); and

permitting said first thread to exit said notification state (col. 14 lines 29-49).

12. As per claims 14-15, Agesen teaches the invention as claimed, including an apparatus comprising means for implementing the method of claims 9-10, respectively (Fig. 1).

13. As per claims 16-18, Agesen teaches the invention as claimed, including an apparatus comprising means for implementing the method of claims 11-13, respectively (Fig. 1).

***Response to Arguments***

**14. Applicant's arguments filed September 7, 2004 with respect to the rejections under 35 USC §101 have been fully considered but they are not persuasive.**

15. Applicants argue, *"Applicants depict in Fig. 1 a computer processing environment and describe in the accompanying text that the logic presented therein is implemented within, in one example, this computer processing environment. Specific to the rejection, the means for functionality recited in independent claims 5, 14 and 16 is implemented within the depicted computer processor."*

16. While it is noted that the features recited in independent claims 5, 14, and 16 may be executed on a processor, this feature is not reflected in the claims. The "means for" steps could be construed as a software application, rather than a processor suited for executing the necessary instructions for performing the steps. The rejections under 35 USC §101 would be withdrawn if the feature specifying that the steps are executed on a processor were included in independent claims 5, 14, and 16. An apparatus claim must be tangibly embodied or include recited hardware as part of the apparatus.

**17. Applicant's arguments with respect to the art rejections of claims 1-18 have been considered but are moot in view of the new grounds of rejection.**

***Conclusion***


18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Syed J Ali whose telephone number is (571) 272-3769. The examiner can normally be reached on Mon-Fri 8-5:30, 2nd Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai T An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Syed Ali  
January 13, 2005



MENG-AI T. AN  
SUPERVISOR, PATENT EXAMINER  
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